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SUMMARY OF FOOD SURVEYS MADE IN THE UNITED STATES

Edith Hawley
Food Economist
Bureau of Home Economics

The food surveys that have been made in the United States are brought together in Tables 1 to 3 and classified as follows: 1, dietary studies; 2, cost and standard of living studies; 3, qualitative food surveys. The dietary studies in Table 1 are divided into two parts -- first, the family dietary studies, and second, the dietary studies made in institutions.

Tables 1 and 2 show that actual records in more or less detail have been kept of the food consumed by 2,924 families and that estimates of the amount of food consumed or the cost or both have been made by 66,242 families. Of the data that have been collected pertaining to family food consumption the following analyses have been made:

Type of Analysis	<u>Number Analyzed</u>
Average expenditure per family	65,567
Average amount of foodstuffs consumed	30,777*
Average energy and protein value (about)	2,603
Average energy, protein and mineral value (about)	330
Evaluation of individual family diets -	
Cost	2,659
Energy and protein	565
Energy, protein and minerals	271

The qualitative food surveys shown in Table 3 include more than 5,000 families and almost 18,000 children. The analysis of the data is largely descriptive.

In addition to the types of food surveys presented in the tables, food consumption figures have been calculated from production, import, export, and population figures. Studies have also been made of the consumption of individual foodstuffs in order to arrive at the factors that determine the purchasing habits of the American housewife. In order to ascertain the cost of food in the American diet, surveys have also been made of the retail prices of the important foodstuffs. These are weighted according to food budgets which may be based on either actual or optimum consumption habits.

* About 4,000 of these give values for a few specified foodstuffs instead of the complete diet.

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TABLE 1. DIETARY STUDIES IN THE UNITED STATES.

Investigator	Date	Locality	Aspect especially emphasized	Method of collecting food data	Type of family or institution	Average Size		Scale for calculating No. of adult male units	Number of Food records		Length of study Days	Extent of analysis of food data	Standard for judging adequacy	Primary use of results
						Persons Number	Adult male units Number		Collected	Analyzed				
1. FAMILY														
Atwater and Co-workers	1886-1903	14 states	Nutrients furnished	Record - inventory	Many classes	Not summarized	Not summarized	Atwater	334	334	1 to 90	Calories, protein, fat, carbohydrate and cost ¹	Atwater's ³	To set nutritive standards
Sherman and Gillett	1914-15	N.Y.C., O., Conn., Calif.	Food habits	Record - waste deducted	Not given	6.8	-	Not given	102	92	7	Calories, protein, Ca., P., Fe., and cost	Sherman's ⁴	Education; welfare work
League for Preventive Work	1917	Boston	Food habits and cost	Amount purchased	Workmen	6.7	Not given	Sherman and Gillett	243	200	7	Calories, protein, cost; expenditures for food groups ⁵	2500 - 3500 calories per man	Education; welfare work
Bureau of Labor Statistics - Office of Home Economics	1916	D. C.	Nutritive value of diet	Record - waste deducted	Workmen - clerks	5.0	3.8	Atwater	31	31	7	Calories, protein, cost; ¹ consumption figures	3000 calories Hunt's distribution among food groups	To determine cost of an adequate diet
Goldberger, Wheeler and Sydenstricker	1916	S. C.	Food habits	From store accounts ⁶	Workmen (textiles)	5.5	4.1	Atwater	798	743	15	Average consumption - 32 foods; calories, ² protein, vitamins	3000 calories	Relation between diet and pellagra
H. W. Atwater	1918	41 states	Food habits	Record - inventory	Workmen - Farmers and clerks	Not given	3.6	Atwater	500	500 73 farmers	7	Average consumption calories, protein, cost ²	3150 calories 80-90 grams protein	Food consumption on the farm
Phillips and Howell	1917-18	New York City	Food habits	Record - inventory	Workmen	5.3	Not given	Atwater	105	105	7	Calories, protein, Ca., P., Fe., and cost ¹	Sherman's	Education; welfare work
Mudge	1922	N.Y., Mass., Mich., Tenn.	Food habits	Record	3 income groups Italian	5.6	-	Not given	38	38	7	Calories, protein, Ca., P., Fe., and cost ¹	Sherman's	Education
Mudge	1923	Ill., Pa., Ohio, Mass.	Food habits	Record	3 income levels Polish	7	-	Not given	36	36	7	Calories, protein, Ca., P., Fe., cost ¹ , Expenditures for food groups.	Not given	Education

II. INSTITUTIONS

Atwater and Co-workers	1886-1907	14 states	Nutrients furnished	Record - inventory	Students and others	Not summarized	Not summarized	Atwater	98	98	3 to 209	Calories, protein, fat, carbohydrate, and cost ¹	-	To set nutritive standards
Wassow and Grindley	1910	Illinois	Nutrients furnished	Food as eaten	Hospital insane	54.5	-	None	2	2	7	Calories, protein, fat, carbohydrate, P., total ash	Atwater's	To improve diet
Rose and Jacobson	1911	New York	Method	Record - inventory	Hospital children	164	116.3	Atwater	1	1	30	Calories, protein, Ca., P., Fe., distribution of 13 food groups	3200 calories	Method of studying a dietary
Gephart	1915	Concord, N.H.	Nutrients furnished	Accounting records ⁸	School boys	Not given	-	None	1	1	365	Calories, protein, fat, carbohydrate	3500 - 4150 calories	Evaluation and revision of school diet
Wilson and Rathbun	1916	New York City	Cost and variety or diet	Food as eaten	Sanatorium tuberculosis	580	-	None	1	1	7	Calories, protein, fat, carbohydrate, cost.	3100 - 3200 calories	To improve quality and decrease cost
Macleod and Griggs	1917	Vassar (N.Y.)	Nutrients and cost	Record - inventory ⁹	Women students	115	-	None	1	1	15	Calories, protein, fat, carbohydrate, cost	1900 - 2200 calories per woman	Evaluation of diet
Borthwick	1917	Montana State College	Nutrients and cost	Food as purchased	Women students	Not given	-	Not given	1	1	212	Calories, protein, Ca., P., Fe., cost	None	Evaluation of diet
Murlin	1918	U. S. Survey of army	Suitability of army ration	Record	Men (army)	About 100	-	None	227	227	Not given	Calories, protein, fat, carbohydrate, cost, waste, average consumption	3000 - 4250 calories	To improve the army diet and reduce waste
Wilder	1919	Cook County, Illinois	Adequacy - cost and waste	Food as eaten	Children	About 100	-	None	4	4	Not given	Calories, protein, fat, carbohydrate, cost	Gillett's ¹⁰ Sherman's ¹¹	Evaluation of diet
Bailey	1918-21	Kansas	Adequacy - cost	Record	State	Not given	-	None	12	9	120 - 365	Calories, protein, fat, carbohydrate, cost	3500 calories 120 grams protein	Evaluation of diets
Bevier	1920	University of Illinois	Nutrients cost	Record - waste deducted	College students	About 25	-	None	12	9	7	Calories, protein, fat, carbohydrate, cost	Not given	To reduce cost and evaluate diet
Kramer and Grundmeier	1925	Manhattan, Kansas	Nutrients cost	Record	Students	23.2	-	Not given	60	20	30	Calories, protein, Ca., P., Fe., cost	Sherman's	To improve diet
Roberts and Waite	1925	Chicago	Food consumed by individuals	Food as eaten	Children (day nursery)	80	-	None	80	80	7	Calories, protein, minerals, and milk consumption of individuals	Sherman's standard	To improve diet in day nursery

1. Each family's diet analyzed.

2. Average consumption figures analyzed.

3. Some of these studies were summarized and a dietary standard was established.

4. Sherman's standard is: 3,000 calories; 75 grams protein; 1.32 to 1.44 grams phosphorus; 0.67 to 0.69 gram calcium; 0.015 gram iron.

5. In the analysis of expenditure, no allowance was made for differences in family size and composition.

6. Expenditures for food were not included. Estimates of the home-produced foods were secured from the housewife.

7. A correlation was also made between the amount of animal protein used and pellagra incidence.

8. Garbage was collected and analyzed; total waste was estimated.

9. Waste was deducted.

10. Calories as given in the pamphlet, "Food Allowances for Healthy Children".

11. Sherman's standard for children per 100 calories consumed: 2.5 grams protein; 0.048 grams phosphorus; 0.023 grams calcium, and 0.0005 gram iron.

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TABLE 2. COST AND STANDARD OF LIVING STUDIES.

Investigator	Date	Locality	Aspect especially emphasized	Method of collecting food data	Type of family	Average size of family or household		Scale for calculating No. of adult male units	Number of food records		Extent of analysis of food data	Standard for judging adequacy	Primary use of results
						Persons Number	Adult male units Number		Collected	Analyzed			
Mass. Bureau Statistics of Labor	1874-75	Mass. - 36 localities	Wages	Survey	Workmen	5.14 F	-	None	397	397	Average expenditure for meat, fish, milk, and groceries.	None	-
U. S. Department of Labor	1888-90	10 states	Cost of production	Survey	Workmen iron, steel	5.09 H	2.5 "normal"	Bureau Labor Statistics	2490	1257 "normal"	Average consumption of nine foods; average expenditure	None	Regulation of tariff rates
U. S. Department of Labor	1888-91	23 states	Cost of production	Survey	Workmen cotton, woolen	5.22 H	2.8 "normal"	Bureau Labor Statistics	4319	1657 "normal"	Average consumption and cost of 9 foods	None	Tariff rates
U. S. Department of Labor	1902	33 states	Retail prices	Survey	Workmen not over \$1200 income	4.88 H	Not given	Bureau Labor Statistics	25440	25440 1043	Average expenditure, consumption and cost, 20 foods	None	Weight index number
More	1903-05	New York City	Standard of living	Survey and accounts	Workmen	5.6 H	Not given	Atwater	200	200 10	Average expenditure, cost per man per day	17 to 20¢ per man per day	Welfare work
Forman	1905-06	D.C.	Standard of living	Accounts	Poor	6.5 F	4.68	Bureau Labor Statistics	19	19	Average expenditure	None	-
Chapin	1907	New York City	Standard of living	Survey	Workmen "normal"	5.0 F	3.5	Atwater	391	391 100	Average expenditure; number diets inadequate	22¢ per man per day	Welfare work
Byington	1907-08	Homestead, Pa.	Standard of living	Accounts	Workmen (steel mill)	Not given	3.1	Atwater	90	90	Average expenditure	22¢ per man per day	Welfare work
Worcester (Bur. of Labor Statistics)	1907-08	Mass., Ga., N. C.	Standard of living	Store accounts	Workmen (cotton mill)	7.8 H	5.5	Atwater	35	35	No summary	Cost of Atlanta prison diet	To set a fair standard
(Great Britain) Board of Trade	1909	18 states	Wages	Survey (food and rent)	Workmen	4.9 H	-	None	7616	7616	Average consumption and expenditure - 42 foods ¹	None	Comparison with Great Britain
Kennedy	1909-10	Chicago	Standard of living	Accounts	Workmen (stockyards)	5.33 H	-	None	184	184	Average expenditure - total and five food groups	None	To set a fair standard
Peck	1905-14	Minnesota	Cost of food, fuel, rent	Accounts	Farmer	Not given	4.9	(footnote 2)	22	22	Average consumption and expenditure - 10 foods	None	Farm management studies
Funk	1913-14	14 states	Furnished commodities	Survey	Farmer	Not given	4.8	over 12 = 1.0 12 & under = 0.5	950	950	Average consumption 52 foods	None	Farm management studies
Little and Cotton	1913-14	Kensington, Philadelphia	Standard of living	Accounts	Workmen (textile)	5.2 H	4.0	Atwater	23	23	No summary	26¢ per man per day	To set a fair standard
Dallas Wage Commission	1917	Dallas, Texas	Cost of living	Survey	Workmen	4.8	-		50	50	Average expenditure		Wage adjustment
U. S. Bureau of Labor Statistics	1916	D. C.	Cost of living	Survey	Workmen clerks	6.7 (family) 4.9 (household)	Not given	Bureau Labor Statistics	2110	2110	Percent of families spending specified amounts	31¢ per man per day	Wage adjustment
U. S. Bureau of Labor Statistics and Emergency Fleet Corporation	1917	35 coast cities	Cost of living	Survey	Workmen (shipbuilding)	5.3	3.7	Bureau Labor Statistics	5225	5225	Average consumption & cost by localities	None	Wage adjustment
Chamber of Commerce	1918	Spokane	Cost of living	Questionnaire	Workmen clerks	Not given	-	None	240	240	Average expenditure	None	-
Bureau of Municipal Research	1918	Philadelphia	Decent standard	Survey	Workmen	5.04 F 5.57 H	3.8	Atwater	365	260	Average consumption and nutrients - 138 foods	3,150 calories 100 grams protein	Wage adjustment ³
U. S. Bureau of Labor Statistics and War Labor Board	1918-19	42 states	Change in standard	Survey	Workmen	4.9 F	3.32	Bureau Labor Statistics	12096	119	Average consumption - 128 foods. ⁴	None ⁴	Revise index number
Noble	1918-19	Groton, N.Y.	Living conditions	Survey	Workmen (Corona type)	4.3 H	2.8	Atwater	119		Average expenditure	None	-
Johnson	1912-22	Missouri	Cost of Farming	Records kept	Farmer	5.0 H	-	over 10 = 1.0 10 & under = 0.5	156	156	Average expenditure	None	Farm management studies
Mossell	1921	Philadelphia	Standard of living	Survey	Workmen (negro)	3.5			100	100	Average expenditure		Philadelphia Bureau of Municipal Research Standard
U. S. Bureau of Labor Statistics	1921	Ill., Ind., O., Pa., W. Va.	Cost of living	Survey	Workmen (coal miners)	5.6 H	4.12	Not given	301	299	Average expenditure	None	Wage adjustment
Nienburg	1922-23	Pennsylvania	Standard of living	Survey and store books ⁵	Anthracite coal miners	5.8 F 6.1 H	-	None	910 ⁵	910 550	Average expenditure percent expended for 50 foods	Hunt's proportion of food groups	Wage adjustment
Nienburg	1922	W. Va., Pa., Ill., O., Ala.	Cost of living	Store sales ⁶	Bituminous coal miners	-	-	Not given	None	None	Average expenditure percent expended for 55 foods	Not given	Wage adjustment
Kirkpatrick	1921-25	11 states	Standard of living	Survey	Farmers	Not summarized		Not summarized		3121	Average expenditure	None	

1. By income and nationality groups.
2. "Children old enough to perform regular farm labor equivalent to regular hired men were considered as adults. Others were estimated at certain proportions of adults according to age, size, work performed, and amount of food consumed, according to the judgment of the route agent.
3. The results were also used in establishing a budget which would give a fair standard of living.
4. Coburn analyzed the nutritive value of average food consumption figures for normal families in eleven cities. Sherman's standard was used for judging adequacy.
5. Expenditure records were collected by the survey method from 712 families. The major expenditures of 198 families were taken from store and mine company records.
6. The total amount of commodities sold by the stores in the vicinity was divided by the number of families in that locality. Mail orders were also obtained and included.
7. F means family; H, household.

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TABLE 3. QUALITATIVE FOOD SURVEYS IN THE UNITED STATES

Investigator	Date	Locality	Primary purpose of the study	Correlated with	Method of collecting food data	For family or individual	Type	Number of food records		Extent of analysis of food data	Standard for judging diet	Evaluation and use
								Collected	Analyzed			
Siler, Garrison and MacNeal	1912-13	S. C.	Cause of pellagra	Food habits	Survey	Family	6 mill villages	(5,514 = population)	-	Number using 6 specified foods ¹	None	Unjustified correlations ²
Jobling and Petersen	1916	Nashville, Tenn.	Cause of pellagra	Food habits	Survey	Individuals	Pellagrins	Not given	Not given	Percent using eggs, milk, meat and legumes	High, medium and low protein diets	Not clearly defined correlation
Harris	1918	New York City	Changes in expenditures and living habits	Increased cost of living	Survey	Family	Chiefly tubercular	2,084	2,084	Foods dispensed with or substituted	Previous habits	Indicate elasticity of demand
Roberts	1918	Gary, Ind.	Habits of pre-school child	General conditions and diet	Survey ³	Individual	Children 1 to 7	6,015	6,015	Extensive analysis and correlation ⁴	Presence or absence of 6 food groups; habits ⁵	Points out needs in education
Roberts	1919-20	Kentucky	Physical condition	Food habits	Survey ³	Individual ⁶	Children 2 to 11	256	256	Extensive analysis and correlation ⁴	Not described	Descriptive; shows need of education
Committee on Public Safety	1919	Rochester, N. Y.	Milk consumption, Percent of total food consumed	Undernourished children	Survey	Family Individual	All classes school children	1,330 10,025	1,330 10,025	Correlated with Height, weight, income	Children under 6 - 1 qt; 6-16 yrs. - $\frac{1}{2}$ qt. adult - $\frac{1}{3}$ qt.	Important for planning educational program
Moore	1922	Missouri 6 counties	Health of children	Diet	Survey ³	Individual	Rural school children	1,431	1,431	Percent of children in each diet grade	Presence of certain foods ⁷	Descriptive; shows conditions ⁸

1. Specified foods are: shipped-in cornmeal, locally grown cornmeal, fresh meat, canned (tinned) foods, milk and eggs.

2. Correlations were made between families using certain foodstuffs and incidence of pellagra without ascertaining whether pellagrins ate these foodstuffs.

3. Menu for the previous day was secured; quantity of milk commonly used was estimated.

4. Percent of children with adequate, questionable and inadequate diets; an attempt to correlate the type of diet with certain physical characteristics, income, etc.

5. Food groups are: milk, vegetables, fruit, cereals, potatoes, coffee and tea. Habits include regularity and number of meals, suitability of foods, eating between meals, etc.

6. Type of diet used by the family was studied.

7. Foods used in judging are: coffee, tea, pie, meat, biscuits, pancakes, milk, cereal, fruit, vegetables, sweets.

8. A correlation between diet and weight is not striking.

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